



REMARKS

Objection to the Drawings

The drawings have been objected to for not showing every feature of the invention specified in claims 21, 26, 30, 34 and 37. Applicants traverse the objection to the drawings since the reference to "material" in claims 21, 26, 30, 34 and 37 constitutes the material from which the toroidal body is formed. The toroidal body is fully shown in the drawings as filed. The "material" reference in the claims is fully supported in the specification such as at page 5, lines 26 through 30.

Claim Objections

Claims 21, 26 and 30 are objected to because of informalities. The claims have been amended to correct the informalities. As claimed, the invention relates to an annular antenna apparatus. Such a claiming is definite and in statutory compliance, fully supported by the application as filed.

35 U.S.C. Section 102

Claims 21 through 40 have been rejected under 35 U.S.C. Section 102(e) as anticipated by Brown et al (USP 6,546,982). This rejection is respectfully traversed for the following reasons.

The subject invention is directed to providing an annular antenna apparatus suitable for sundry uses including in a tire for the purpose of monitoring of tire parameters by an external reader and that can withstand the harsh environment of an internal tire chamber, as well as the repeated stresses induced on the antenna apparatus by the tire. To compound the difficulty in achieving such objectives, the apparatus must be relatively light so as to not unduly add to a tire's weight and be easily attachable to the tire either while the tire is being manufactured or in a post manufacturing stage.

The claims recite an annular antenna, the antenna being formed as a continuous loop

capable of resilient axial elongation in response to external forces in combination with a direct magnetic coupling to a toroid body that allows for such axial elongation when necessary to avoid antenna breakage. Such a coupling in combination with the resilient configuration of the antenna that facilitates an elongation prevents breakage of the antenna from external stresses imposed by use of the tire. The conductor forming the antenna is formed of relatively fine gauge conductive material that would otherwise be susceptible to breakage as the tire flexes and deforms throughout its operative life. The coupling of the continuous antenna loop protects the antenna since the antenna is free to move axially within the toroidal body bore as necessary. The resilient configuration of the antenna allows the antenna to resiliently lengthen and contract when subjected to outside forces without causing breakage.

The cited art collectively fails to teach or suggest the claimed combination of antenna loop configuration and direct magnetic coupling between the antenna and a toroidal body. For this primary reason, rejection of the pending claims is traversed. The deficiencies of each piece of cited art in teaching or suggesting the invention is summarized below.

The Brown reference, contrary to the Examiner's position, does not identify "744" as a throughbore at col. 23, lines 20 and 36. Rather, 744 is one of two end portions of antenna 740 that are terminated within the patch. End 744 extends through the bottom surface 714 of the patch where it is connected to the end 754 of the coil 750 (column 23, lines 44 through 50). Thus, antenna 740 does not extend through a through bore in direct magnetic coupled relationship with a toroidal body (claims 21, 26, 30, 34, and their dependents); and is not in a mechanically decoupled relationship with a toroidal body. It is not seen how the Examiner is concluding that the Brown antenna is in a mechanically decoupled relationship from FIG. 7 when FIG. 7 clearly shows the antenna being wound around coil 750. Further, as amended, the claims require the antenna to be capable of elongation when subjected to externally

originating strain forces. No such structure is taught or suggested by Brown. Further, contrary to the Examiner's position, the Brown antenna approaches the coil 750 parallel to and not at right angles with the opening through coil 750 as shown in FIG. 7. Claim 23 thus is not met by the Brown reference as a result.

In general, Brown, and in particular FIG. 7 thereof, has been misapplied as teaching the claimed structure of claims 21 through 40 for Brown does not teach a direct magnetically coupled, mechanically decoupled relationship between a loop antenna and a toroidal body; a loop antenna extending through a toroidal body at a right angle with the opening; or an antenna of a construction that elongates in response to external forces. The reference cannot properly be deemed to anticipate the invention therefor.

For the reasons above, Brown fails to teach the method of claim 37 for Brown does not achieve a direct magnetic, mechanically decoupled relationship by the steps set forth in the claims. Brown achieves a magnetically coupled relationship by terminating ends of the antenna to a coil, thereby establishing a decidedly mechanical connection that cannot accommodate antenna flexure in response to externally originating forces.

As Brown et al. fails to anticipate the invention as recited in claims 21 through 40, it is respectfully requested that this rejection be withdrawn.

35 U.S.C. Section 103

Claim 28 is rejected under 35 U.S.C. Section 103(a) as being unpatentable over Brown et al. in view of Pappas et al. (USP 4,319,220). This rejection is respectfully traversed for at least the reasons set forth above in regard to Brown, and for the following additional reasons.

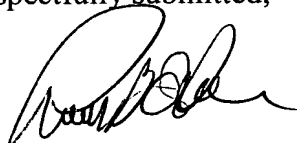
While Pappas shows an antenna that is wavy, it does not form a continuous loop as required by the claims. See page 9, lines 59 through 61, wherein Pappas specifically states the antenna 152 is preferably molded as an almost complete circle that can be fitted with a

tire wall. Thus, Pappas does not teach or suggest the claimed invention. Moreover, at column 10, lines 7 through 10, Pappas teaches clamps 156 attached to the antenna “for attaching thereto three appendages, namely the sensor 102, the power generator...”. Thus, Pappas not only does not teach a continuous loop, but specifically teaches a mechanical connection between the antenna and a sensor unit. Pappas, as well as Brown, therefore, embodies the very shortcomings that the present invention was intended to address. Neither reference singularly teaches a mechanically decoupled, direct magnetic coupled, relationship between a continuous loop and a toroidal body. It is illogical, accordingly, that their combination could somehow instruct one skilled in the art toward the claimed configuration of the present invention.

As Brown et al. in view of Pappas fails to establish *prima facie* obviousness of the invention as recited in claims 28, it is respectfully requested that the rejection be withdrawn.

In light of this amendment, all of the claims now pending in the subject patent application are allowable. Thus, the Examiner is respectfully requested to allow all pending claims.

Respectfully submitted,



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